



# Does local competition make a difference for store profitability?

An empirical study of 168 Swedish supermarkets

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## **Abstract**

Much of what we know about the effects of competition on store performance emanate from SCP studies of grocery retail stores located in different geographical markets. These studies have provided empirical support for the notion that low competition endows firms with market power, enabling them to set higher prices compared to firms located in more competitive markets. However, to what extent the effect of competition on prices translates into higher gross margins and higher profits and profitability on the store level appears to be an unanswered question. One reason being that valid and reliable data on the profitability of individual stores never or very seldom are disclosed for research by retail companies.

This study takes previous empirical research on the effects of local competition in retailing one step further, by investigating the relationships between competition and various aspects of economic performance of 168 supermarkets, all owned and managed by individual retailers affiliated to the voluntary ICA chain in Sweden. A unique database has been created by pooling data from income statements and balance sheets with details on local competition. Local competition is depicted in three dimensions: concentration, horizontal vs. intertype competition, and spatial monopoly.

The main contribution of this study is that it establishes an empirical relationship between competition and bottom-line economic performance. The results show that competition has a significant effect on conduct and financial performance. In more competitive markets, supermarkets price lower, conduct “more” on non-price attributes, and achieve lower profitability compared to stores facing little competition. This study thus validates the SCP-paradigm and it explicitly shows that market power opportunities on the local market level is translated into higher profitability performance of stores. As such, the study has important implications for competition authorities’ actions as well as for retail management decisions.

## **Introduction**

High competition is the back-bone of the market economy. Weak competition is expected to lead to excessive profits, high prices, low productivity and slow economic growth.

Competition thus affects both the income side of a company and the cost side. The income side in that low competition makes it possible to charge higher prices than when high competition prevails. The cost side in that low competition is expected to make companies less prone to keep costs at the lowest possible level. How the effects of low competition on the income and cost side of the equation affect net profit or return on assets is an unanswered question. Neither do we know how the degree of competition affects various cost items or the productivity of retail stores.

Knowing how competition affects costs and return on assets is important for companies and the authorities alike. For firms knowing that the competitive environment affects the behavior of management and is of importance when evaluating the performance of managers. For the authorities it is important to learn whether competition affects productivity and profits for the firms and thus the efficiency of the distribution systems and how well the market economy functions.

These issues are of special interest for retailers since they operate in regions and local environments with varying degree of competition. We know from earlier studies that prices are higher in less competitive environments, but no studies have shown how costs and profits are affected by local variations in competition.

The reasons for the lack of studies regarding how competition affects costs, profits and return on assets is that retailers seldom reveal internal financial data to researchers. Another difficulty with using such data is that variations in book-keeping practices between retail firms make them non-comparable. Furthermore, the conduct of retailers is seldom possible to measure in detail. A unique feature of this research is that we have managed to overcome these difficulties and we thus have reliable and valid data measuring all of the parts of the Structure-Conduct-Performance paradigm.

The measured effects of competition on store performance emanate from studies using the Structure-Conduct-Performance (SCP) paradigm as a foundation for comparing the price level of grocery retail stores located in different geographical markets. The rationale for such an empirical approach is that the nature of competition can be assumed to be similar across markets, while the market structure usually differs due to differences in market size and/or for historical reasons (Asplund and Friberg, 2002).

These studies have provided empirical support for the SCP notion that low competition endows firms with market power, enabling them to set higher prices compared to firms located in more competitive markets.

However, to what extent the effect of competition on retail store prices translates into effects on economic performance of stores is an unanswered question. To the best of our knowledge there exist no previous studies that explicitly address the question to what extent local competition makes a difference for profitability performance of retail stores. The aim of the present study is to take previous research on the effects of local competition in retailing one step further, by an empirical investigation of the relationships between competition and various aspects of economic performance of retail stores.

Basically, the economic performance of retail stores concerns net sales, gross profit, and operating costs. See Table 1.

Table 1 Revenues, costs, and profits of stores (Berman and Evans, 2006).

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|                         |   |
|-------------------------|---|
| Net sales               | The revenues received by a store during a given time period. Net sales is determined by (1) the number of customers during the time period, and (2) the size of the transaction per customer.   |
| Cost of goods sold      | The amount paid to acquire the merchandise that is sold during a given time period.   |
| Gross profit            | The difference between net sales and the cost of goods sold. Expressed as a percentage of net sales, this figure is labeled <i>gross margin</i> .   |
| Operating costs         | The costs of running a store. Operating costs may be further separated into, e.g., labor cost, rent cost, promotion cost, other operating costs, and cost of capital. Each cost item may be expressed as a percentage of net sales, and referred to as a <i>cost percentage</i> . |
| Net profit before taxes | The profit earned after all costs have been reduced from net sales. Expressed as a percentage of net sales, this figure is labeled <i>net margin</i> .  |

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Based on findings of previous studies that low local competition is associated with higher prices, one could be tempted to infer that this would also lead to higher gross margins and gross profits, although we have found no previous study providing empirical support for such an inference. Furthermore, even if such a relationship between higher prices and higher gross profits should be at hand in areas with low competition, it remains to be shown if such a relationship implies higher net profit as well, or if stores having the opportunity to charge

higher prices make more expensive, higher quality differentiated offers, that results in more operating costs eliminating the gain in gross profit from higher prices. Another potential source for a non-relationship between prices and net profit may be that stores located in highly competitive markets operate with a higher level of “discipline” that increases productivity and lowers operating costs, compensating for a lower gross margin from lower prices.

The effect of local competition on the economic performance of grocery stores certainly is a complex phenomenon, calling for an investigation into the effects of competition on non-price elements as well as the price element of conduct, and on various aspects of economic performance. The present study takes previous empirical research one step further by incorporating assortment, service level, and promotion side by side with the price level to depict conduct, and by explicitly investigating the productivity, costs and profitability performance of retail stores facing different market structures. A unique database has been created by pooling data from various sources, facilitating comprehensive analyses of the relationship between competition, conduct, productivity and profitability of 168 supermarkets in 168 different geographical markets in Sweden.

## **Retail store performance**

It is important to recognize that the term “economic performance” of retail stores is a multi-dimensional construct, and that the magnitude of the effects from competition may vary, depending on what aspect of performance one is referring to. Dunne and Lusch, 1999, classify store performance in terms of three broad categories: (1) market-based performance, which captures how well a store succeeds in attracting consumers in the local market where it operates (measured by, e.g., sales volume and market share), (2) productivity performance, (e.g. sales per square meter floor area, sales per labor hour), and (3) financial performance (revenues, costs, profit, and profitability).

The present study addresses the two latter of these three categories, i.e. productivity and financial performance. Financial performance of a retail store concerns gross profit and various operating cost items (see Table 1) on the one hand, and the amount of capital invested in merchandise and fixed assets, on the other. Profitability in terms of return on assets of a retail store is, by definition, the amount by which gross profit exceeds operating costs, related to the amount of investment made in the store. As such, profitability performance is related to other aspects of economic performance, and may be viewed upon as the “ultimate” economic performance.

## **Competition between retail stores**

### **Concentration**

In general, theories of imperfect competition postulate that as market structure deviates from the conditions of perfect competition, firms have the opportunity to make use of market power, i.e. an opportunity to set prices that excessively cover costs, and gain higher profit. The details of economic theories on imperfect competition are rarely observable in practice, and thus difficult to subject to empirical tests. In empirical studies the degree of imperfect competition is usually measured by concentration measures, such as concentration ratios and/or the Hirschman-Herfindahl index, of different geographical markets within the same industry. Such an approach is also adopted in the present study. The motivation for such an approach is that the *nature* of competition can be assumed to be similar across markets, while the market structure differs due to market size differences and/or historical reasons (Asplund and Friberg, 2002).

However, when put into a context of retailing, it may be argued that concentration measures of market structure do not provide the full picture of the local competition faced by a retail store, but merely one of three aspects of competition. Besides concentration, conditions referring to (1) spatial monopoly and (2) intertype competition need to be taken into account when describing the competition between retail stores. These two aspects are elaborated on in the following.

### **Spatial monopoly**

One of the core assumptions of perfect competition is a market characterized by a situation of “many small firms selling close substitutes”. Although there are, in the grocery retail industry, a large number of stores selling similar grocery products, this does not imply that grocery retailing satisfies the condition of perfect competition in the sense that firms are price-takers with respect to a homogenous product. Retailing does not provide a physical product like manufacturing, to be transported to selling locations, but an “extended product” at a certain location (Achabal et al., 1984). The large number of retail stores serve different, and geographically separated local markets, not one single market. Rather than “*How many grocery stores are involved in supplying a given group of people?*” the relevant question becomes “*Between how many grocery stores do people in that group usually make their choice?*” (Nooteboom, 1980). This spatial character of grocery retail competition introduces elements absent in aspatial competition (Eaton and Lipsey, 1979), and all stores enjoy some degree of monopoly power over their immediate market area (Craig et al., 1984). As a consequence, there may well be partial, or spatial, monopolies within a seemingly fierce competitive market at some level of aggregation. Such partial monopolies typically occur

when the distances between stores are large relative to the distances that consumers are willing, or able, to travel (Nootboom, 1980).

Furthermore, grocery stores are not always close substitutes. Although the products sold in different stores often are identical, and indeed are substitutes from a consumer perspective, the “output” of a grocery store is a “bundle of services” (Achabal et al., 1984) with several dimensions, such as the price level, location (proximity), accessibility (e.g. car parking facilities), the merchandise mix and other aspects of service, in a retail mix which is not homogeneous across competitors. Indeed, to consumers price is an important factor, but not necessarily the only or, perhaps, even the one of top priority. In at least one aspect – location – every grocery store is unique and differentiated from its competitors.

One conclusion from this reasoning is obvious, and indeed grasped à priori – retail competition is not “perfect” in the sense that one can speak of a uniform price for a uniform product, demanded by uniform consumers. When one looks at the locational aspects of a store, there are arguments in favor of partial (spatial) monopolies. Looking at other aspects, one can see arguments in favor of oligopoly or arguments that point in a direction to perfect competition.

### **Intertype competition**

Furthermore, competition in retailing is not only restricted to competition between stores within similar strategic groups (Porter, 1980), such as competition between supermarkets in a local market, but comprises competition between stores belonging to different strategic groups that offer different combinations of price level and quality of shopping experience to consumers. For example, local competition is often between supermarkets, discount stores, and hypermarkets. This aspect of competition between stores is usually referred to as *intertype* competition, while competition between stores within the same strategic group is referred to as horizontal or intratype competition (Palamountain, 1955; Ghosh, 1994; Levy and Weitz, 2004).

Concentration measures of market structure typically fail to mirror the intertype aspect of competition. In the absence of more than one strategic group in a local market, competition points in the direction of perfect competition. However, before horizontal competition is taken as an indication of moving competition in the direction of perfect competition, one must recall that the argument holds only if stores are located close to each other, relative to the mobility of customers. If not, an element of spatial monopoly is introduced. Palamountain (1955) also proposed that in horizontal competition there is an element of oligopoly, in the sense that competitors tacitly follow a shared practice of setting uniform profit margins, while competing in non-price dimensions (“service” in a broad sense of the word) of the retail mix.



But once services have been introduced they are generally difficult to abolish, and this results in a gradual “trading up” within a format.

**Competition in the present study**

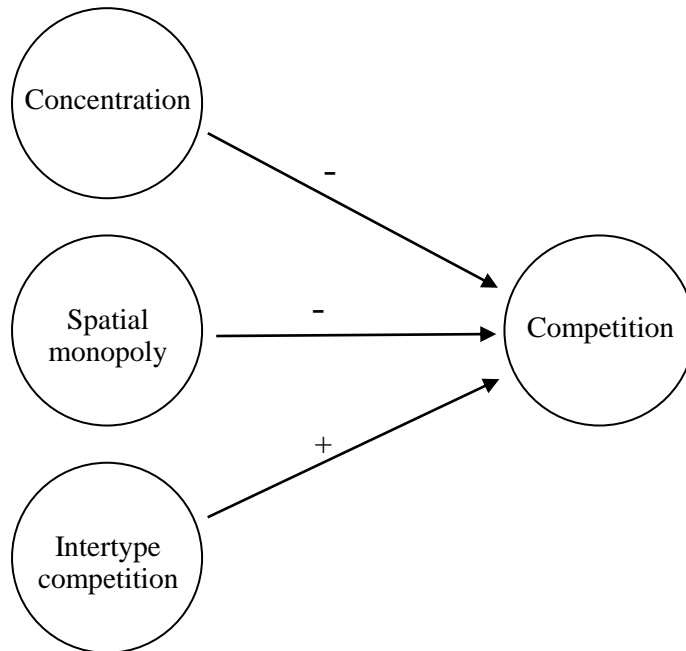
In the present study, market structure is described via three aspects of competition: (1) concentration, (2) spatial monopoly, and (3) intertype competition. See Table 2.

Table 2 Constructs of market structure in the present study.

| Construct             | Definition   |
|-----------------------|--|
| Concentration         | The degree to which the seller side of a market diverges from the infinite number of sellers of perfect competition. |
| Spatial monopoly      | The degree to which a store is geographically separated from its competitors.  |
| Intertype competition | The degree to which the seller side of a market is constituted by various store formats.                             |

The competition facing a supermarket in its local market is assumed to decrease with concentration and spatial monopoly, and increase with intertype competition:

Fig. 1 The competition facing a supermarket is assumed to decrease with concentration and spatial monopoly, and increase with intertype competition.



## Theory, previous studies, and hypotheses

### Competition and conduct

In accordance with the SCP paradigm, the view taken on the interplay between market structure and store conduct in the present study is that the former will be conditions around which the competitive environment is shaped, and within which stores operate in constant interaction. The assumption made is that when developing the retail mix for a supermarket, the retailer considers the market structure of his (her) store's local environment.

Theory holds, and previous empirical research has shown, that prices are related to the concentration aspect of competition: Prices are increasing with increased concentration among sellers in a market due to the execution of market power.

Lamm (1981) found significantly higher prices in more concentrated areas, in a study of 72 stores located in eighteen U.S. standard metropolitan statistical areas (SMSAs). Cotterill (1986) applied the Hirschman-Herfindahl Index (HHI) as a structural measure of local competition in a study of 35 U.S. supermarkets. He found support for the notion that market power is being exercised in more concentrated markets; supermarkets located in more

concentrated markets charged higher prices. Cotterill also found that a store's market share had a strong positive effect on its price level.

Aalto-Setälä (2002) in a study of 182 grocery stores in Finland, found that local market concentration was positively associated with markups.

Intertype competition, i.e. local competition between various strategic groups in terms of store formats, has been found to influence prices on the local market level. For instance, in a study of grocery store prices in narrowly defined markets (roughly equivalent to a postal code area) across Sweden, (Asplund and Friberg, 2002) found market shares (at the municipality level) of hypermarkets and large supermarkets to be negatively related to prices, i.e. the more substantial the presence of these store formats in a local market, the lower the prices.

Marion (1998) investigated the influence on food prices from various store formats. Increased concentration was associated with increases in food prices, and the introduction of discount or hypermarket competition into a market was associated with lower prices.

In a study of prices in 107 stores in 34 U.S. towns, Cotterill (1999) found increased three-firm concentration ratios associated with higher prices, and increased market shares of discount operators with lower prices. Further, stores categorized as "warehouse stores" were found to charge lower prices, compared to stores categorized as "traditional supermarkets" (i.e. units not categorized as warehouses and that did not have staff at counters to provide customized delicatessen, seafood, etc.).

The first hypothesis thus refers to negative relationship between competition and the price level of a grocery stores:

H1: Competition in a local market is...

H1a: ... negatively related to the price level of supermarkets.

But a grocery store competes also with its quality of shopping experience, constituting a major part of its value in the eyes of consumers. Thus, a reasonable assumption is that also non-price attributes of the retail mix are influenced by market structure.

Previous studies of performance on the store level have only to a small extent comprised a test on how non-price retail mix elements relate to competitive structure. Cotterill (1999) is an exception, explicitly incorporating five non-price attributes in a structural equation modeling of competition and price. The results showed that stores in more concentrated markets offer

fewer services. These results suggest that market power is being exercised in the quality dimension as well as in the price dimension. Based on these findings, the expectation of the present study is that the more competitive a supermarket's local market is, the greater will be the efforts of the retailer to differentiate the supermarket from local competitors by providing "more" on non-price attributes.

More specific, the hypotheses are to find competition positively related to merchandise variety, positively related to service level, and positively related to promotion level:

H1: Competition in a local market is...

H1b: ... positively related to the merchandise variety of supermarkets.

H1c: ... positively related to the service level of supermarkets.

H1d: ... positively related to the promotion level of supermarkets.

### **Competition and store performance**

Stores located in markets where competition is low are thus expected to exert market power, setting prices higher compared to stores in markets where competition is high. Further, this effect of competition on price conduct is expected to translate into an effect on gross margin performance: the more competitive the local market, the lower the prices, and the lower the gross margin performance. The third hypothesis thus refers to a negative relationship between the level of competition and the gross margin of stores:

H2: Competition in a local market is...

... negatively related to the gross margin of a retail store.

The effect of competition on gross margin and gross profit performance may not, however, translate into an effect on net margin and net profit performance. For one thing, it is reasonable to expect that productivity would be higher, and translating into lower average costs, in markets where competition is high, since the pressure on prices and gross margins should be such that only the most efficient can continue to operate under such conditions.

Leibenstein (1966, 1976) argued that when competition is poor, business organizations will suffer from higher costs, due to the tolerance and maintenance of "X-inefficiencies". The reasoning behind this argument is that the consequences of inefficient behavior are different for monopolies than for firms operating under intense competitive conditions. In terms of the

context of the present study, an inefficient supermarket in a highly competitive market area may not be able to remain in business because prices (and by extension gross profit) are low, translating inefficiency into too low or even negative profit, while an inefficient supermarket possessing a monopoly position in a local market can remain profitable enough, due to the market power opportunity to charge higher prices (and earn higher gross profits).

High competition thus compels the retailer to be disciplined regarding all resources – managing space, inventory, and labor as efficiently as possible. In other words, the expectation becomes that although supermarkets located in markets with high competition are expected to have less market power, and thus lower prices and lower gross margin, there is less effect from competition on the net margin, as more competition brings about a greater “discipline” in store operations, resulting in improved productivity and lower operating costs. Such an argument may be questioned based on the notion that a retailer with a monopoly position, like any other, prefers more to less. However, a monopoly supermarket may not have the same ability to operate as efficiently as a supermarket operating under intense competition; the latter can observe, and learn, market prices and relate these to operational efficiency and draw conclusions on its costs relative to those of competitors. Hence, a supermarket facing high competition may operate more efficiently than a monopoly supermarket, because it is more difficult for a monopolist to monitor internal efficiency.

The hypotheses thus becomes that competition is positively related to inventory productivity, labor productivity, and space productivity:

H3: Competition in a local market is...

H3a: ... positively related to the inventory productivity of retail stores.

H3b: ... positively related to the space productivity of retail stores.

H3c: ... positively related to the labor productivity of retail stores.

Developing hypotheses referring to the effects of competition on cost and profit performance of supermarkets are anything but a straightforward procedure. For one thing and as pointed out above, competition compels the retailer to be disciplined regarding the utilization of resources – labor, space and inventory. However, high competition is expected to initiate “more” conduct on non-price attributes as more competition calls for “more” in order to differentiate the store in the market. Nevertheless, everything considered competition is expected to be negatively related to average operating costs, as the pressure on prices and gross margins will call for cost efficiency in order to secure economic viability under more competitive conditions.

However, all cost items among operating costs might not decrease with competition. Due to the call for higher efforts in order to differentiate a store in more competitive markets, costs for marketing and promotion are expected to increase with competition. In summary, the expectations of the present study are to find that competition is negatively related to labor cost and “other” operating costs of the income statement of supermarkets, but positively related to promotion cost:

H4: Competition in a local market is...

H4a: ... negatively related to the average labor cost of a retail store.

H4b: ... positively related to the average promotion cost of a retail store.

H4c: ... negatively related to the average other operating costs of a retail store

Based on H2 and H4, the effect of local competition on net profit margin of retail stores is contingent on the differential effect on gross margin and average cost. As one moves towards supermarket performance on the “bottom line” the expected results are difficult to predict via logical reasoning, and consequently difficult to formulate in terms of hypotheses.

Nevertheless, the hypothesis of the present study is that the effect of competition on price and gross margin is translated into an effect on net margin and return on assets. Although productivity is expected to be higher and average cost lower from higher competition, the notion that retailers prefer more to less is taken as a springboard for an expectation that retailers having the opportunity to exercise market power translates this opportunity into higher profitability performance, although at productivity and cost levels inferior to the levels of stores facing more competition:

H5: Competition in a local market is...

H5a: ... negatively related to the net margin of a retail store.

H5b: ... negatively to return on assets of a retail store.

## **Method**

### **Design of the study**

A cross-sectional design was developed for the study by pooling data on store performance, store attributes, and local market conditions. A unique database was constructed, containing (1) the economic performance of 168 supermarkets along with (2) a description of their attributes, and (3) a description of the competition in their local market area.

All supermarkets are affiliated to the ICA Group in Sweden. Each store is operated, and owned, by an individual retailer. As such, the conduct of the stores is mainly a consequence of decisions made by managers in individual stores. Specifically, the following features of the store owners' autonomy are important to mention. Each owner of the store decides on prices, as well as non-price attributes of the marketing mix. The stores, however, use the same accounting system, providing prerequisites for reliable comparisons of their economic performance.

### **Delineation of local markets**

Previous studies have adopted various approaches to the important issue of delineating the geographical area to inspect for establishing the market structure facing the stores under study. Some studies rely on political or statistical boundaries, measuring competition at, for example, the "town" or "municipality" level. Asplund and Friberg (2002) used postal code areas as market areas. Others have relied on some "rules of thumb", and suggest that an area of a certain fixed distance (e.g. one mile) separating the store from its environment is to be inspected for demand and competitive conditions. Aalto-Setälä (1999) defines the local market by relating store size in terms of square meters of floor area to population density.

In the present study, the recommendations of Gripsrud and Gronhaug (1985) are followed for defining the local market of each store. Gripsrud and Gronhaug (1985) argue that the definition of the "local" market of a store should incorporate the judgment of the store manager. The argument for this standpoint is that it is the local manager's perception of what is the "local" market that is instrumental in his or her decisions on conduct issues. Thus the radius of a geographic area surrounding each store in accordance with each of the 168 store managers' perception of what area constitutes the trade area.

### **Data sources and data collection procedures**

Data on economic performance of the stores were provided for 200 randomly selected ICA Supermarkets, by the internal Accounting Service Bureau of ICA, supporting the ICA stores

with services of daily accounting and annual reports. Due to incomplete records, 32 stores were taken out of the sample. All data refer to the fiscal year 1996.

Attributes of the 200 stores were gathered in collaboration with the ICA market research department. This collaboration provided data on prices, merchandise variety, open hours, promotion frequency, and the existence/nonexistence of add-on service in terms of offering opportunities to make bets on sport events and horse races.

Local competition of each local market was established by the following procedure. A complete list of all grocery stores operating in the Swedish retail sector, provided by “Dagligvaruleverantörernas Forbund” (DLF; an organization supporting the grocery suppliers in Sweden) was the starting-point for a description of the local competition facing each of the 168 stores in the sample. The list comprised information about the size (annual sales volume and floor area), address (the list is used by suppliers for mailing and visiting activities on the store level), store format (i.e. if the store is a hypermarket, discount store, upgraded petrol station or “other” store), and to which retail chain organization the store is affiliated. Further, the information contains the geographic location of the store, in terms of an (x,y)-coordinate. These pieces of information facilitate a description of the local competitive conditions for each of the 168 supermarkets. A computer program was constructed for establishing – for each of the 168 stores – which stores from the list that were located within certain various distances from the store, and within the trade area as defined by the store manager.

## **Operationalization of variables**

### ***Store Performance***

Income statements and balance sheets were provided for each of the 168 supermarkets. Further, information per supermarket was delivered on physical size (floor area in square meters), and the amount of labor hours used. Thus, a comprehensive description of the performance of each supermarket is created, comprising all three categories of economic performance suggested by Dunne and Lusch (1999), i.e. market based performance (sales volume), productivity performance, and financial performance.

Some adjustments of the original income statements were carried out, in order to make them more valid for the purposes of the present study:

1. The salary paid to the retail manager varied substantially between the stores. For this reason, the salary paid to the retail manager of each store was substituted by the salary paid to managers of ICA stores operated as subsidiaries to the ICA Retail corporation.



2. In forty-one of the stores, the fixed assets were leased from a finance company within the ICA Retail corporation. The income statements and balance sheets of the forty-one stores were updated to an appearance as if the assets were owned by all stores.
3. Part of the promotion costs on the store level are costs that are allocated to the stores from the parent organization, ICA Retail Corp. As the promotion activities are identical by content and frequency for all 168 stores, these costs are eliminated from the promotion costs on the store level.

The absolute measures of sales volume, gross profit, and operating costs are highly correlated, and each of the measures is highly correlated with store size (floor area). Hence, it became necessary to “scale” the absolute measures to have a common basis for comparison across stores of different size. The scaling is carried out by expressing cost and profit items as cost percentages and profit margins of net sales. See Table 3.

Table 3 Financial performance as a percentage of net sales.

|                                  | Mean  | St.dev. | Median | Min   | Max   |
|----------------------------------|-------|---------|--------|-------|-------|
| <i>Costs and profit</i>          |       |         |        |       |       |
| Net sales                        | 100.0 | n.a.    | n.a.   | 100.0 | 100.0 |
| Cost of sold goods %             | 79.2  | 1.7     | 79.3   | 73.5  | 83.3  |
| Gross margin %                   | 20.8  | 1.7     | 20.7   | 16.7  | 26.5  |
| Promotion cost %                 | 1.1   | 0.5     | 1.0    | 0.2   | 2.3   |
| Labor cost %                     | 11.0  | 1.3     | 10.8   | 8.2   | 15.8  |
| Other operating costs %          | 6.1   | 1.2     | 6.0    | 3.2   | 11.3  |
| Operating margin%                | 2.7   | 2.2     | 2.9    | -5.7  | 9.1   |
| Depreciation                     | 0.9   | 0.6     | 0.8    | 0.1   | 4.6   |
| Net margin%                      | 1.8   | 2.2     | 2.1    | -6.2  | 8.1   |
| <i>Asset turnover</i>            |       |         |        |       |       |
| Turnover in inventory            | 18.2  | 5.0     | 17.4   | 8.1   | 38.8  |
| Turnover in fixed assets         | 18.5  | 8.2     | 17.8   | 2.9   | 46.4  |
| Turnover controllable assets     | 8.6   | 2.4     | 8.6    | 2.6   | 14.8  |
| <i>Profitability performance</i> |       |         |        |       |       |
| Return on controllable assets    | 16.5  | 19.7    | 17.1   | -52.5 | 101.0 |

### *Store conduct*

The market research department of ICA's head-office provided data describing the conduct of each of the 168 supermarkets. Eight operationalized variables are available for depicting supermarket conduct, representing its "price level", "merchandise variety", "service level", and "promotion level".

The price level of the 168 supermarkets is represented by a composite price index from a basket of 347 products. In collaboration with an external market research company, the market research department of ICA regularly collect and process price data on the store- and product item level. For the purposes of the present study, the data collection of November 1996 was complemented to comprise all the supermarkets of this study.

Merchandise variety is represented by the total number of stock-keeping units (SKU's) comprised by the merchandise offer.

The service level is described by four measures, (1) open hours, (2) add-on services in terms of opportunities for shoppers to make bets on sport events and horse races, (3) number of checkouts, and (4) number of parking places adjacent to the store. All 168 stores offered personal selling of delicatessen. As this service item is not differentiating the stores from each other, it is not incorporated in the data set.

Promotion level is measured by a measure of frequency by which the store conducts "external" promotion in terms of advertising offers or direct mailing offers. The measure takes on an integer value ranging from 1 to 6, representing "never" (1), "less than once a month" (2), "once a month" (3), "more often than once a month" (4), "once a week" (5), and "more often than once a week" (6). As shown above we also have promotion cost in the data set.

Forty of the 168 supermarkets are representatives of the governmentally owned gambling service company, offering add-on service to shoppers in terms of opportunities to make bets on sport events and horse races.

Table 4 Store conduct variables. Descriptive statistics.

|                               | Mean  | St.dev. | Median | Min   | Max    |
|-------------------------------|-------|---------|--------|-------|--------|
| <i>Price level</i>            |       |         |        |       |        |
| Price index                   | 100.5 | 3.8     | 101.1  | 86.4  | 109.5  |
| <i>Merchandise variety</i>    |       |         |        |       |        |
| Number of SKU's in assortment | 8,310 | 2,456   | 8,000  | 2,000 | 16,500 |
| <i>Service level</i>          |       |         |        |       |        |
| Gambling service (dummy)      | n.a.  | n.a.    | n.a.   | 0     | 1      |
| Open hours                    | 69.0  | 8.7     | 69.0   | 48    | 98     |
| Number of checkouts           | 3.9   | 1.6     | 3.0    | 2     | 11     |
| Number of parking places      | 88    | 96      | 50     | 0     | 700    |
| <i>Promotion level</i>        |       |         |        |       |        |
| Promotion frequency           | 3.5   | 1.9     | 4.0    | 1     | 6      |

### ***Market structure***

Six variables describe the structure of competition in local markets. Three of the variables refer to concentration, one to spatial monopoly, and two to intertype competition. Table 5 reports substantial variation between the competitive conditions of the 168 local markets.

Table 5 Local market structure variables. Descriptive statistics.

|  | Mean  | St.dev. | Median | Min   | Max    |
|--|-------|---------|--------|-------|--------|
| <i>Concentration</i>                         |       |         |        |       |        |
| Number of competing stores                   | 8.4   | 7.9     | 6.0    | 0     | 50     |
| Concentration ratio (CR1, store level)       | 45.9  | 22.9    | 42.0   | 7.2   | 100.0  |
| Herfindahl Index (store level)               | 3,527 | 2,201   | 3,080  | 288   | 10,000 |
| Herfindahl Index (chain level)               | 4,854 | 1,834   | 4,439  | 2,311 | 10,000 |
| <i>Intertype competition</i>                 |       |         |        |       |        |
| Discount stores' share (%) of floor area     | 6.5   | 9.5     | 0.0    | 0.0   | 41.7   |
| Hypermarkets' share (%) of floor area        | 3.8   | 9.9     | 0.0    | 0.0   | 77.9   |
| <i>Spatial monopoly</i>                      |       |         |        |       |        |
| Distance (meters) to nearest competing store | 2,954 | 5,312   | 776    | 0     | 28,002 |

A single-factor solution of a principal component analysis of the three concentration variables retains more than 85% of the total variance in the three variables, with component loadings of 0.96 (Herfindahl Index at store level), 0.91 (Herfindahl index at chain level), and 0.91 (one-firm concentration ratio).

An analysis of the interrelationships between the dimensions of competition (i.e. between concentration, spatial monopoly, and intertype competition) shows that concentration and spatial monopoly is strongly related. The correlation coefficient between the principal component score of concentration and the measure of spatial monopoly (i.e. the distance separating a supermarket from its nearest competitor) is positive and significant ( $r=0.50$ ,  $p<0.01$ ). Further, intertype competition conditions are associated with concentration and spatial monopoly. The correlation coefficient between the market share of discount stores and hypermarkets on the one side, and concentration ( $r=-0.29$ ) and spatial monopoly ( $r=-0.26$ ) on the other are significant ( $p<0.01$ ). A higher level of intertype competition is thus associated with more intense competition in terms of less concentration and – spatial monopoly. On average, local markets containing discount stores and/or hypermarkets are substantially less concentrated, and supermarkets in these markets possess – on average – substantially less spatial monopoly over their immediate market area.

A principal component analysis of the measures of the three dimensions of competitive structure (the principal component score of concentration, the distance to nearest competitor, and the market share of discount stores and hypermarkets) report significant support for a single component solution of an overall “competition” factor, retaining 57 percent of the variance with an eigenvalue of 1.7. The correlation coefficients between the factor and the original variables are 0.82 (concentration), 0.80 (spatial monopoly) and -0.63 (intertype competition). The factor score of overall competition was multiplied by (-1) in order to change its interpretation into higher values representing higher levels of competition.

## **Results**

### **Introduction**

The hypotheses are tested in three ways. First we calculate bivariate correlations between the structure, conduct, and performance variables. As reported above scale of operation may have a strong impact on both conduct and financial performance. For this reason we also report the results of the bivariate relationships when we control for scale of operation. Finally, a SEM-analysis is conducted where the viability of the SCP-paradigm is tested with return on assets as the dependent variable. As a measure of scale of operation sales area is used.

Two variables measuring competition will be used in the analyses. The first one is the composite measure of competition reported above, where the variables measuring competition are subject to a factor analysis and the factor scores for the one factor solution are summed. The second variable is the Herfindahl index for the trade area. The reason for also reporting this measure of competition, is that it is an often used measure of competition in earlier studies. Both measures of competition are coded so that higher values depict more competition.

Besides using the individual conduct variables in the analyses a composite conduct index is used consisting of all conduct variables except price. The individual measures of productivity as well as a composite measure consisting of all three productivity variables are used when studying the effect of the independent variables on productivity. In both instances the composite variables are formed through factor analysis using the factor scores to form the index.

### Competition and conduct

The expectations of this study are to find that competition is positively related to all conduct variables excepting price where we expect a negative relationship. The following variables are used: number of check-outs, number of parking places, number of SKUs, whether store has gambling services, promotion frequency and number of business hours per week and price.

Table 6 Competition and conduct. Correlation coefficients and partial correlation coefficients (controlling for scale of operation). \*  $p \leq 0.10$  \*\*  $p \leq 0.05$  \*\*\*  $p \leq 0.01$

| Variable                 | Competition |                     | Herfindahl index |                     |
|--------------------------|-------------|---------------------|------------------|---------------------|
|                          | Correlation | Partial correlation | Correlation      | Partial correlation |
| # check-outs             | 0.31***     | 0.20***             | 0.28***          | 0.26***             |
| # parking places         | 0.27***     | 0.14*               | 0.25***          | 0.20**              |
| # SKUs                   | ns          | -0.20***            | ns               | -0.19**             |
| Gambling services        | ns          | ns                  | ns               | ns                  |
| # opening hours per week | 0.32***     | 0.27***             | 0.28***          | 0.24***             |
| Promotion frequency      | 0.21***     | 0.14*               | 0.18**           | 0.13*               |
| Conduct index            | 0.36***     | 0.22***             | 0.33***          | 0.25***             |
| Price                    | -0.35***    | -0.32***            | -0.32***         | -0.42***            |

The results are fairly clear-cut and consistent: Competition has an impact on the conduct of the stores, both regarding services and pricing, and irrespective of whether we control for scale or not. Stores in areas with higher competition show more conduct than stores in less competitive areas. Also, as has been shown in numerous earlier studies, prices are lower in competitive areas than in less competitive areas. The results do not vary at all between the two measures of competition.

### **Competition and productivity**

It is expected that competition is positively related to productivity.

Table 7 : Competition and productivity. Correlation coefficients and partial correlation coefficients (controlling for scale of operations) \*  $p \leq 0.10$  \*\*  $p \leq 0.05$  \*\*\*  $p \leq 0.01$

| Variable               | Competition |                     | Herfindahl index |                     |
|------------------------|-------------|---------------------|------------------|---------------------|
|                        | Correlation | Partial correlation | Correlation      | Partial correlation |
| Inventory productivity | 0.20**      | 0.16**              | 0.22***          | 0.19**              |
| Space productivity     | 0.16**      | Ns                  | 0.21***          | 0.17**              |
| Labor productivity     | 0.23***     | Ns                  | 0.29***          | 0.24***             |
| Productivity index     | 0.23***     | 0.22***             | 0.28***          | 0.28***             |

We find that the results when not controlling for scale are in the expected direction. Higher competition leads to higher productivity – and this is the case for all four productivity measures. All relationships are significant in the expected direction for the Herfindahl measure of competition but for the composite measure of competition, where controlling for scale makes a difference, in that the partial correlation for space productivity and labor productivity are not significant.

Taking into account that the composite measure of productivity shows significant correlations in the expected direction and that all results for the Herfindahl index also are according to our expectations, and only two results are not significant, the results clearly indicate that stores in highly competitive areas achieve higher productivity than stores where competition is weaker.

### **Competition and financial performance**

It is expected that high competition will lead to worse financial performance than low competition. It is thus expected that stores in local markets with lower competition will have higher gross and net margins, and higher return on assets, but higher operating costs as a

percentage of sales. We use the individual operating costs in the analysis, since we expect that promotion costs as a percentage of sales will be higher in more competitive environments (above we saw that promotion frequency was higher in more competitive areas).

Table 8. Competition and financial performance. Correlation coefficients and partial correlation coefficients (controlling for scale of operations) \*  $p \leq 0.10$  \*\*  $p \leq 0.05$  \*\*\*  $p \leq 0.01$

| Variable                      | Competition |                     | Herfindahl index |                     |
|-------------------------------|-------------|---------------------|------------------|---------------------|
|                               | Correlation | Partial correlation | Correlation      | Partial correlation |
| Labor cost%                   | -0.18**     | ns                  | -0.21***         | -0.15*              |
| Other operating costs%        | -0.24***    | ns                  | ns               | ns                  |
| Promotion costs%              | 0.39***     | 0.32***             | 0.37***          | 0.32***             |
| Gross margin%                 | -0.30***    | -0.29***            | -0.35***         | -0.34***            |
| Net margin%                   | -0.24***    | -0.25***            | -0.13*           | -0.24***            |
| Return on controllable assets | -0.17**     | -0.29***            | -0.35***         | -0.19**             |

When not controlling for scale of operation we find that labor cost and other costs as a percentage of sales are lower for stores facing stronger competition and gross margin as a percentage of sales is higher when competition becomes slacker. Return on controllable assets and operating profit as a percentage of sales both increase when competition becomes lower. When we control for scale the significant partial correlation for labor cost and other operation costs disappears.

The main conclusions from the previous analyses hold when controlling for scale. The relationship between labor cost and competition is not significant when scale is held constant, while promotion cost still is significantly related to competition with more promotion conducted in more competitive areas. However, gross margin as a percentage of sales, relative operating profit and return on controllable assets all still increase with lesser competition in the same way as when we did not control for scale.

To conclude, we find that the role of competition seems to be in accordance with what economic theory would postulate: less competition leads to higher return on assets than stronger competition, and strong competition has an effect on productivity – it becomes

higher in more competitive environments than in less competitive contexts, even when controlling for scale.

### **Structural equation model of return on assets**

The structure-conduct-performance paradigm in essence postulates a structural causal model and thus naturally lends itself to structural equation modelling (SEM). The final test of the hypotheses is thus made using maximum likelihood estimation with Amos 18. The following model was tested (figure 2).

Scale of operation, measured by selling area, and competition, with the manifest variables concentration, distance to nearest competing store, discount store share of floor area, and hypermarket share of floor area, are considered to be independent of each other and to have direct effects on conduct and return on controllable assets. Conduct, with the manifest variables number of check-outs, number of parking spaces, number of SKU:s, gambling services and promotion frequency and with the separate variable price, is expected to have a direct effect on return on controllable assets. To keep the model simple, productivity is not included in the model.



Fig. 2 The effects of scale of operation, competition, conduct, and price on return on assets. Only the direction of the significant relationships ( $p < 0.05$ ). Only the latent variables are shown.

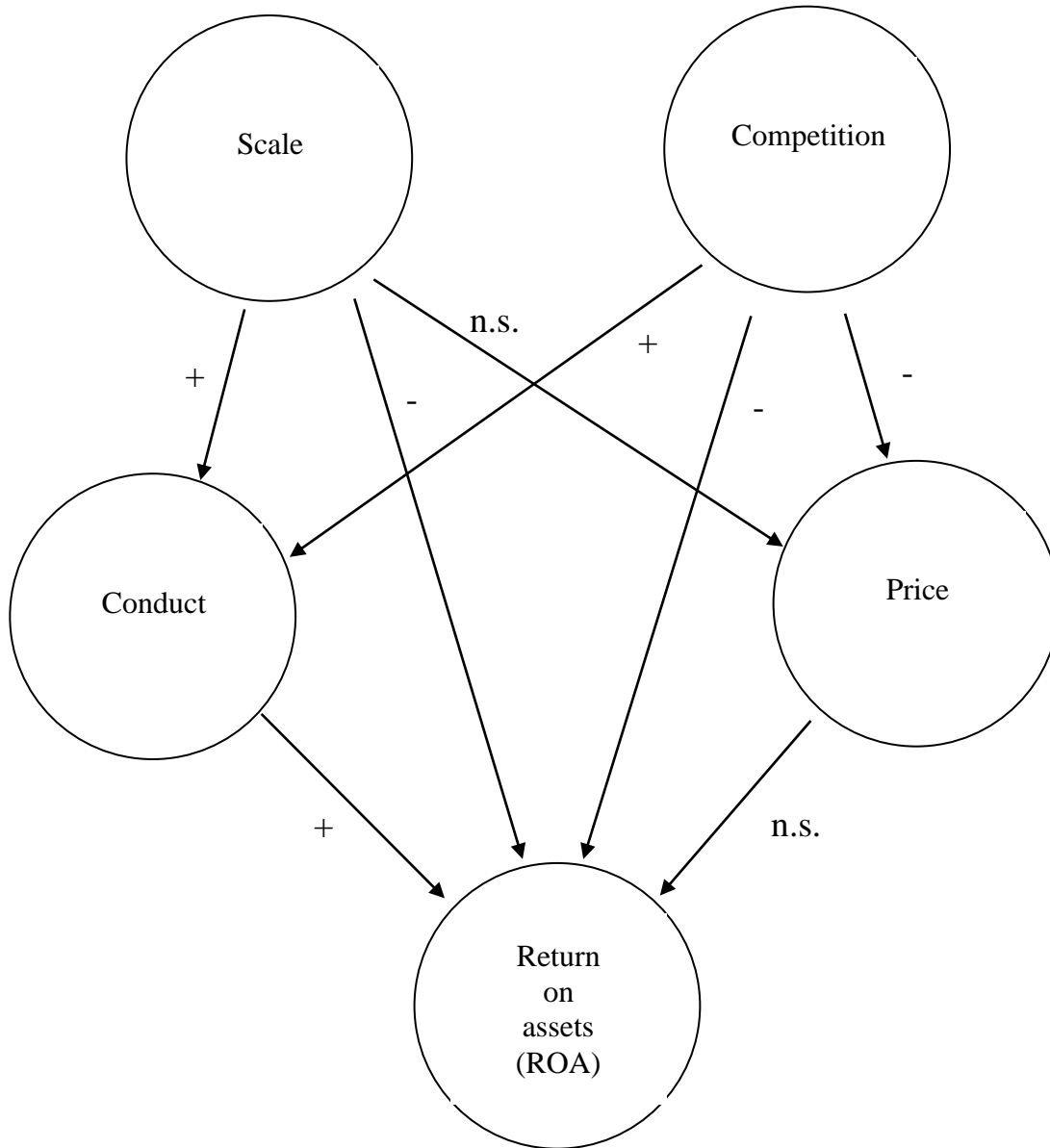


Table 9 Standardized coefficients and fit statistics for the structural model.

|   |   |             | Estimate      | C.R.   | P <=  |
|---|---|-------------|---------------|--------|-------|
| Conduct                                 | ← | Scale       | 0.851         | 5.096  | 0.001 |
| Price                                   | ← | Scale       | -0.091        | -1.298 | 0.194 |
| Conduct                                 | ← | Competition | 0.179         | 2.756  | 0.006 |
| Price                                   | ← | Competition | -0.448        | 4.699  | 0.001 |
| ROA                                     | ← | Conduct     | 0.453         | 2.163  | 0.031 |
| ROA                                     | ← | Scale       | -0.390        | -2,149 | 0.032 |
| ROA                                     | ← | Price       | 0.095         | 1.082  | 0.279 |
| ROA                                     | ← | Competition | -0.242        | 2.242  | 0.025 |
| $\chi^2/df/p$ -value                    |   |             | 86.6/49/0.001 |        |       |
| Root mean square error of approximation |   |             | 0.07          |        |       |
| Goodness-of-fit index                   |   |             | 0.93          |        |       |

The model performs reasonably well, with a Goodness-of-Fit index above 0.90 and a Root mean square of approximation below 0.08.

The results again provide support for the hypotheses regarding the relationship between competition, conduct and performance. Both scale of operation and competition drive conduct – increasing scale of operation also increases conduct and when competition becomes weaker store lessen their conduct and increase their prices. Furthermore and more importantly we find again that competition has a significant impact on financial performance, in that lower competition leads to higher profits.

### Summary of findings

The relationships between competition, store conduct and store profitability turned out to be in line with expectations. Competition was found to be negatively related to the price levels of the stores in the study, supporting H1a. The path coefficient between the latent variable of non-price store conduct was found positively influenced by competition, supporting H1.

Partial correlation analyses (controlling for scale of operation) between competition and various aspects of store conduct showed significant correlation coefficients in line with the

hypotheses, merchandise variety being the exception. The price level showed a negative correlation with the level of local competition. Prices are thus lower in supermarkets located in more intensely competitive local markets, supporting H1a. Contrary to expectations, the merchandise variety was found decreasing with competition. H1b is not supported.

The service level is increasing with competition. When controlling for scale of operation, the number of checkouts, number of parking places, and number of open hours are increasing with the level of competition, supporting H1c. Promotion frequency was found increasing with competition. H1d is supported.

Competition was further found positively related to store productivity. The higher the level of local competition, the higher the productivity performance among the sample stores. Controlling for scale of operation, inventory productivity, space productivity, and labor productivity reported positive and significant correlation coefficients with competition. H3a, H3b, and H3c are supported.

Competition was found to affect the financial performance of retail stores in the expected direction. Gross margins were found decreasing with competition, as well as labor costs as a cost percentage of sales. H2 and H4a are supported. Promotion cost percentage, was found increasing with competition, supporting H4b. Other operating costs were unrelated to competition, leaving H4c unsupported.

The joint effect of competition on gross margin and cost percentages turned out in a negative effect of competition on net margin. The higher the level of competition in local markets, the lower the net margin of retail stores in this study. H5a is supported.

The effect on net margin was also found translating itself into a negative effect on profitability performance – profitability decreased with increased local competition. Both the correlation analyses and the SEM analysis reported a significant and negative effect from local competition on return on assets. H5b is supported.

## **Discussion**

This study clearly shows that the behavior of firms is affected by competition. Firms in competitive environments are more productive than firms in less competitive environments and they charge lower prices and have lower costs than firms that face weaker competition. Despite higher costs firms in less competitive environments achieve higher returns on controllable assets than firms facing stronger competition. Competition really matters both regarding the behavior of firms and their financial results. Thus, the SCP paradigm is

validated by this study. From a public policy view-point the study emphasizes the importance of ensuring sound competition to achieve an efficient economy. It seems that firms adapt to the level of competition – when it is weak market power can be used to increase prices and generate excess profits – when it is strong firms have to increase their efficiency and lower their prices in order to survive – to the benefit of the consumer collectivity. The results of this study emphasizes the vital role that competition plays for ensuring a sound market economy and an efficient business sector.

The study also indicates that firms adapt their behavior and policies to the competitive context they work in. With increasing competition management has to target cost savings and put a heavy emphasis on marketing, while management facing weaker competition can make less use of marketing and may put less emphasis on cost savings, but use market power to increase prices to compensate for higher costs and thus ensuring satisfactory return on assets. This behavior of the firms is what the SCP paradigm would predict as well as economic theory. None of these theories, however, predicts that firms in less competitive environments also will have higher return on assets. As stated above firms facing lesser competition, even if they can charge higher prices, may also be less efficient because of less need to be efficient or because they do not learn best practices from competitors. However, we find that firms facing weak competition, not only exercise market power in charging higher prices, but they also manage to contain costs to the extent that they get richer than firms facing more competition. From a business perspective the study indicates that it is profitable for retail firms with multiple outlets to adapt their behavior to the level of competition each store is facing and of course to assess the competition that each outlet is facing. These adaptations can probably be highly profitable.

### **Limitations and further research**

An important limitation of this study is that it focuses on grocery retailing, a certain format of grocery retailing and in one particular country. Of interest would be to study other sectors of retailing, in other countries and with other types of organizational set ups. Do for instance chain stores adapt their pricing policies to the competitive environment in which each store is located? A replication of this study thus is of interest to see whether the results hold, especially the result regarding return on assets.

Another track to follow would be to make micro studies of firms facing different competitive environments in order to better understand how managers transform the context they work in into behavior of the firm. This would give insight into which mechanisms that affect behavior and could be of use for policy makers and managers alike. Studies of this kind would thus shed light on the competitive behavior of firms.

A third area of further research concerns how different types of competitive environments affect firms. How does the number of firms, the size of the competitors, the type of competitors etc affect the conduct of firms? This would give insight into how the competitive forces affect behavior.

Finally, we suggest that studies should be made showing the cost for the consumer collectivity of weak competition as well as the gains of firms utilizing their market power in markets where competition is weak.

## References

Aalto-Setälä, V. (1999). *Economies of Scale, Product Differentiation, and Market Power*. Helsinki School of Economics and Business Administration.

Aalto-Setälä, V. (2002). The effect of concentration and market power on food prices: evidence from Finland. *Journal of Retailing*, 78, 207-216.

Achabal, D. D., Heineke, J.M., and McIntyre, S.H. (1984). Issues and Perspectives on Retail Productivity. *Journal of Retailing*, 60(3), 107-127.

Asplund, M., & Friberg, R. (2002). Food Prices and Market Structure in Sweden. *Scandinavian Journal of Economics*, 104(4), 547-566.

Berman, B., & Evans, J.R. (2008). *Retail Management – A Strategic Approach*, 9<sup>th</sup> ed. Prentice-Hall: Upper Saddle River, New Jersey.

Cotterill, R.W. (1986). Market Power in the Retail Food Industry: Evidence from Vermont. *The Review of Economics and Statistics*, 68, 379-386.

Cotterill, R.W. (1999). Market Power and the Demsetz Quality Critique: An Evaluation for Food Retailing. *Agribusiness*, 15(1) 101-118.

Craig, S.C., Ghosh, A, & McLafferty, S. (1984). Models of the Retail Location Process: A Review. *Journal of Retailing*, 60(1), 5-36.

Dunne, P., & Lusch, R.F. (1999). *Retailing*, 3<sup>rd</sup> ed, The Dryden Press.

Eaton, B., & Lipsey, R. (1979). The Theory of Market Preemption: The Persistence of Excess Capacity and Monopoly in Growing Spatial Markets. *Economica*, 46, 149-158.

Ghosh, A. *Retail Management – A Strategic Approach*, 2<sup>nd</sup> ed. The Dryden Press; 1994.

Gripsrud, G., & Gronhaug, K. (1985). Structure and Strategy in Grocery Retailing: A Sociometric Approach. *The Journal of Industrial Economics*, XXXIII(3), 339-347.

Lamm, R (1981). Prices and Concentration in the Food Retailing Industry. *The Journal of Industrial Economics*, XXX(1), 67-78.

Leibenstein, H. (1966). Allocative efficiency vs. X-Efficiency. *American Economic Review*, 56, 392-415.

Leibenstein, H. (1976). *Beyond Economic Man: A New Foundation for Microeconomics*. Cambridge: Harvard University Press.

Levy, M., & Weitz, B. A. (2009). *Retail Management*, 7<sup>th</sup> ed. Irvine: McGraw-Hill.

Marion, B.W. (1998). Competition in Grocery Retailing: The Impact of a New Strategic Group on BLS Price Increases. *Review of Industrial Organization*, 13, 381-399.

Nooteboom, B. (1980). Retailing: Applied Analysis in the Theory of the Firm. Vithoorn, Holland: J.C. Gieben.

Palamountain, J.C. (1955). The Politics of Distribution. Cambridge MA, USA. 1955.

Porter, M.E. (1980). Competitive Strategy: Techniques for Analyzing Industries and Competitors. New York, NY: Free Press.